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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,635	01/02/2002	Charles T. Black	YOR9-2001-0319-US1	9290
7590	01/11/2005			
McGinn & Gibb, PLLC Suite 200 8321 Old Courthouse Road Vienna, VA 22182			EXAMINER JOHNSTON, PHILLIP A	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/039,635	<b>Applicant(s)</b> BLACK ET AL.	
	<b>Examiner</b> Phillip A Johnston	<b>Art Unit</b> 2881	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Detailed Action***

1. This Office Action is submitted in response to Amendment filed 10-27-2004, wherein claims 1,4,5,10,24-28,31,32, and 37 have been amended. Claims 1-37 are pending.

***Examiners Response to Arguments***

2. Applicants arguments are moot in view of new grounds for rejection.

***Claims Rejection – 35 U.S.C. 112***

3. Amended claims 1,10, and 24-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Amending claims 1,10, and 24-27 with the term “permanently adhered” constitutes the addition of new matter to the claims, since only the terms “strengthen adhesion” and “promoting adhesion” are contained in the specification, and these terms do not provide adequate support for usage of the term “permanently adhered”.

***Claims Rejection – 35 U.S.C. 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5,7-18,20,24-28,31,32 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2004/0131843 to Mirkin, and Mirkin, U.S. Patent Pub. No. 2002/0177143, in view of Anstadt, U.S. Patent No. 6,361,161.

Mirkin (843) discloses the following;

(a) An apparatus and method for dip pen lithography where a probe tip is coated with a pattern compound that includes a nanoparticle containing additive. The coating is applied by dipping the probe tip in a solution of the patterning compound, as recited in claims 1,2,10-15,20,24-27, and 37. See paragraphs [0015], [0053], and [0093];

(b) A variety of patterning compounds that include nanoparticles, as recited in claims 3,5, and 6. See paragraphs [0056] – [0072], [0081] and [0089].

(c) The use of 13 and 20 nm nanoparticles, as recited in claim 4. See paragraphs [0109] and [0114].

Mirkin (843) discloses the claimed invention except for having a specific value of length vs. width that is less than 15%, as recited in claims 1,10 and 24-28. However, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to select a nanoparticle having a value of length vs. width that is less than 15%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Mirkin (843) as applied above fails to teach the use of a coating encapsulating each nanoparticle. However, Mirkin (143) discloses;

(a) The use of silver nanocrystals having a layer of gold grown upon them; i.e., core/shell nanoparticles, as recited in amended claims 1,10,24-28, and 37. See paragraph [0044];

(b) Cobalt core nanoparticles, as recited in amended claim 31. See paragraph [0089]; and

(c) The surfaces of the core/shell nanoparticles can be further modified with organic molecules, including oligonucleotides (conjugated with oleic acid), as recited in amended claims 4,5, and 32.

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843), can be modified to use the coated nanocrystals of Mirkin (143) to provide a method for generating core/shell particles consisting of a silver core and a non-alloying gold shell that can be readily functionalized with oligonucleotides.

The combination of Mirkin (843) and Mirkin (143) fails to teach the use of nanoparticles permanently adhered to a tip. However Anstadt (161) discloses that, in many applications nanoparticles stick to surfaces where Vander Waals forces are

sufficient for permanent adherence, as recited in claims 1,10, and 24-27. See Column 5, line 63-67.

6. Claims 7-9 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mirkin (843), and Mirkin (143), in view of Mirkin, U.S. Patent Pub. No. 2002/0063212.

The combination of Mirkin (843) and Mirkin (143) discloses nearly all the limitations of claims 7-9, and 16-18, but fails to teach the attachment of a single nanoparticle or single nanoparticle layer. However, Mirkin (212) discloses the formation of a single-nanoparticle array using dip pen lithography. See paragraph [0049].

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843) and Mirkin (143), can be modified to use the single nanoparticle deposition method of Mirkin (212), to provide submicrometer arrays thereby allowing identification of chemicals present in the sample areas, including sequencing of nucleic acids.

7. Claims 6,19,21-23,28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mirkin (843), Mirkin (143), Mirkin (212) and in further in view of Colbert, U.S. Patent Pub. No. 2003/0106998.

The combination of Mirkin (843), Mirkin (143), and Mirkin (212) discloses nearly all the limitations of claims 6,19,21-23,28 and 29, but fails to teach the use of adhesion layers, annealing, and electrochemical solutions; however, Colbert (998) discloses;

(a) The use of thin adhesive layers prior to coating the probe tip with nanoparticle solutions, as recited in claims 6 and 19. See paragraph [0055].

(b) The use of UV and annealing as recited in claims 21-23. See paragraphs [0055]-[0058] and [0168].

(c) Dipping a probe tip into electrochemical solution and applying electrical potentials to the probe, as recited in claims 14,15,28 and 29. See paragraph [0034] and [0060].

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843), Mirkin (143), and Mirkin (212) can be modified to use the probe tip attachment methods of Colbert (998) to provide strong, reliably mounted probe tips thereby improving conventional microscopy techniques.

8. Claims 30,31, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mirkin (843), Mirkin (143), Mirkin (212), and Colbert (998), and in still further view of Requicha, U.S. Patent No. 6,508,979.

The combination of Mirkin (843), Mirkin (143), Mirkin (212), and Colbert (998), discloses nearly all the limitations of claims 30,31, and 33-36, but fails to teach the use of spherical nanoparticles. However, Requicha (979) discloses spherical gold nanoparticles between 5 and 30 nm. See Column 2, line 45-50.

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843), Mirkin (143), Mirkin (212), and Colbert (998) can be modified to use the spherical nanoparticles of Requicha (979), to

provide a nanolayer and sacrificial layer thereby providing a second surface on which a next nanolayer is constructed.

### ***Conclusion***

9. The Amendment filed on 10-27-2004 has been considered but the arguments are moot in view of new grounds for rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to


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reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 703 872 9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

January 6, 2005

  
JOHN R. LEE  
SUPERVISOR, PATENT EXAMINER  
ART UNIT 2881